CLAIMS

We Claim:

1. A system to multicast messages to a plurality of workstations in a network, comprising:

an MDP database table comprising a plurality of parameters used to manage transmission and reception of multicast messages in the network;

an MDP server initialization module to read the plurality of parameters from the MDP database table and initialize an MDP session utilizing the plurality of parameters in a plurality of servers;

an MDP client initialization module to read the plurality of parameters from the MDP database table and initialize an MDP session utilizing the parameters in a plurality of workstations;

an MDP server operations module to receive requests to transmit messages, create a MDP information packet for each message, and transmit the message to each recipient designated in the MDP information packet; and

an MDP client operations module to receive messages transmitted by the MDP server operations module, and transmit these messages to a higher level software application.

2. The system recited in claim 1, wherein the MDP server initialization module will activate GRTT probing upon initial activation, wherein GRTT probing is the periodic sending of messages to the plurality of workstations on the network and measuring the time required to receive a response.

3. The system recited in claim 2, wherein the plurality of parameters read by the MDP server initialization module comprise an initial GRTT value, a maximum GRTT value, a GRTT probe minimum interval value, and a GRTT probe maximum interval value.

4. The system recited in claim 3, wherein the MDP server operations module further comprises:

means for generating a GRTT probe in order to measure a greatest round-trip time between a server and each workstation of the plurality of workstations and updating the GRTT initial value stored in the MDP database table.

5. The system recited in claim 4, wherein the GRTT probe is periodically transmitted to each workstation of the plurality of workstations starting at the GRTT probe minimum interval value and increasing an interval between transmissions of the GRTT probe until the interval equals the GRTT probe maximum interval value.

6. The system recited in claim 1, wherein the plurality of parameters read by the MDP server initialization module comprise an initial GRTT value, a recovery cycle, a server compensation factor, a block size, and a segment size.

7. The system recited in claim 6, wherein the MDP server operations module computes a server squelch time based on the recovery cycle, the initial GRTT value, the server compensation factor, the block size, and a segment size.

8. The system recited in claim 7, wherein the MDP server operations module will de-queue a message when the servers squelch time expires.

9. The system recited in claim 5, wherein the MDP server operations module further comprises:

means for computing a server squelch time; and

means for stopping GRTT probing and de-queuing a message when the server squelch time expires.

10. The system recited in claim 1, wherein the MDP client initialization module reads a stream integrity value and a nacking mode value from the MDP database table.

11. The system recited in claim 10, wherein the MDP client operations module will send a negative acknowledgment only upon receipt of an MDP information packet when a field in the MDP information packet indicates that the workstation on which the MDP client operations module executes is an info client.

12. The system recited in claim 11, wherein the MDP client operations module will send a negative acknowledgment when a message is received with missing elements when the MDP information packet designates the workstation on which the MDP client operations module executes is an action client.

13. The system recited in claim 12, wherein the MDP client operations module will compute a message delay time based upon a message size and a maximum transmission rate and will wait for a period time equal to the message delay time upon receipt of an MDP information packet.

14. The system recited in claim 13, wherein the MDP client operations module further comprises:

means to compute a client squelch time; and

means to terminate reception of a message when the client squelch time has expired.

15. A computer program executable by computer embodied on a computer readable medium to multicast messages to a plurality of workstations in a network, comprising:

an MDP database table comprising a plurality of parameters used to manage transmission and reception of multicast messages in the network;

an MDP server initialization code segment to read the plurality of parameters from the MDP database table and initialize an MDP session utilizing the plurality of parameters in a plurality of servers;

an MDP client initialization code segment to read the plurality of parameters from the MDP database table and initialize an MDP session utilizing the parameters in a plurality of workstations;

an MDP server operations code segment to receive requests to transmit messages, create a MDP information packet for each message, and transmit the message to each recipient designated in the MDP information packet; and

an MDP client operations code segment to receive messages transmitted by the MDP server operations code segment, and transmit these messages to a higher level software application.

16. The computer program recited in claim 15, wherein the MDP server initialization code segment will activate GRTT probing upon initial activation, wherein GRTT probing is the periodic sending of messages to the plurality of workstations on the network and measuring the time required to receive a response.

17. The computer program recited in claim 16, wherein the plurality of parameters read by the MDP server initialization code segment comprise an initial GRTT value, a maximum GRTT value, a GRTT probe minimum interval value, and a GRTT probe maximum interval value.

18. The computer program recited in claim 17, wherein the MDP server operations code segment further comprises:

means for generating a GRTT probe in order to measure a greatest round-trip time between a server and each workstation of the plurality of workstations and updating the GRTT initial value stored in the MDP database table.

19. The computer program recited in claim 18, wherein the GRTT probe is periodically transmitted to each workstation of the plurality of workstations starting at the GRTT probe minimum interval value and increasing an interval between transmissions of the GRTT probe until the interval equals the GRTT probe maximum interval value.

20. The computer program recited in claim 15, wherein the plurality of parameters read by the MDP server initialization code segment comprise an initial GRTT value, a recovery cycle, a server compensation factor, a block size, and a segment size.

21. The computer program recited in claim 20, wherein the MDP server operations code segment computes a server squelch time based on the recovery cycle, the initial GRTT value, the server compensation factor, the block size, and a segment size.

22. The computer program recited in claim 21, wherein the MDP server operations code segment will de-queue a message when the servers squelch time expires.

23. The computer program recited in claim 19, wherein the MDP server operations code segment further comprises:

means for computing a server squelch time; and

means for stopping GRTT probing and de-queuing a message when the server squelch time expires.

24. The computer program recited in claim 15, wherein the MDP client initialization code segment reads a stream integrity value and a nacking mode value from the MDP database table.

25. The computer program recited in claim 24, wherein the MDP client operations code segment will send a negative acknowledgment only upon receipt of an MDP information packet when a field in the MDP information packet indicates that

the workstation on which the MDP client operations code segment executes is an info client.

26. The computer program recited in claim 25, wherein the MDP client operations code segment will send a negative acknowledgment when a message is received with missing elements when the MDP information packet designates the workstation on which the MDP client operations code segment executes is an action client.

27. The computer program recited in claim 26, wherein the MDP client operations code segment will compute a message delay time based upon a message size and a maximum transmission rate and will wait for a period time equal to the message delay time upon receipt of an MDP information packet.

28. The computer program recited in claim 27, wherein the MDP client operations code segment further comprises:

means to compute a client squelch time; and

means to terminate reception of a message when the client squelch time has expired.

29. A method to multicast messages to a plurality of workstations in a network, comprising:

reading a plurality of parameters from an MDP database used to initialize and control the transmission of a multicast message on a server;

reading a plurality of parameters from an MDP database used to initialize and control the reception of a multicast message on a workstation;

transmitting the multicast message to a plurality of workstations when a message delay time does not exceed a time computed to transmit the multicast message or the message delay time does not exceed a perishability time contained within multicast message; and

transmitting the negative acknowledgment to the server when the workstation determines that data in the multicast message is missing and when the workstation was designated as an action workstation within a field contained within the MDP information packet.

30. The method recited in claim 29, wherein when transmitting the multicast message to the plurality of workstations a GRTT probe is also transmitted periodically to the plurality of workstations in order to determine the greatest round-trip time it takes for a message to be received by a workstation and an acknowledgment to be sent back to a server.

31. The method recited in claim 30, wherein when the greatest round trip time is determined, the method further comprises:

adjusting the plurality of parameters stored in the MDP database based upon the greatest round-trip time.

32. The method recited in claim 30, further comprising:

calculating a server squelch time based upon the parameters retrieved from the MDP database; and

setting the server squelch time equal to the perishability time when the server squelch time exceeds the perishability time.

33. The method recited in claim 32, further comprising:

monitoring for negative acknowledgments transmitted by workstations to be received the multicast message when the server squelch time has not been exceeded.

34. The method recited in claim 33, further comprising:

retransmitting a portion of the multicast message when a negative acknowledgment is received from a workstation when all data in the multicast message has not been received and a server squelch time has not been exceeded.

35. The method recited in claim 34, further comprising:

computing a client squelch time based upon the plurality of parameters stored in the MDP database;

transmitting a negative acknowledgment when a portion of a multicast message has not been received by the workstation and client squelch time has not been exceeded.

36. The method recited in claim 35, wherein transmitting a negative acknowledgment when a portion of able to cast message has not been received by the workstation occurs only when the workstation has been designated as an action workstation in the MDP information packet.

37. The method recited in claim 36, wherein the client squelch time is computed as equal to $N*T_{rc}*B*F_C$, where T_{rc} is 5*GRTT, N is a recovery cycles, $F_{C\,is}$ a client compensation factor, and B is a block size based on a number of blocks in the message times a segment size.

Add A4 7